DOCUMENT RESUME

ED 220 576 CE 031 876

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TITLE Generic Skills. Secondary School Vocational Model for Craft Trades. Based on Data on the Use of 588 Tool Skills from 1600 Workers and Supervisors in 131 Occupations.
INSTITUTION Canadian Commission of Employment and Immigration, Ottawa (Ontario).
PUB DATE 79
NOTE 12p.; Not available in paper copy due to small type. For related documents see CE 031 878-879.

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Auto Body Repairers; Building Trades; *Craft Workers; Educational Needs; Electrical Occupations; Equipment; Hand Tools; Job Analysis; *Job Skills; Machine Tools; Machinists; Masonry; Mechanical Skills; Mechanics (Process); Metal Working; Models; *Occupational Clusters; *Occupational Information; Repair; Secondary Education; Skill Analysis; Technical Occupations; *Trade and Industrial Education; Transfer of Training; Vocational Education; Woodworking

ABSTRACT

This pamphlet provides a hierarchy of skills, from those most often used in the craft trades to those less frequently used, indicating the extent to which these skills are used by workers in 24 different occupational groups. The pamphlet also provides a secondary school vocational model for craft trades along with lists of the identified skills. This model contains a recommended sequence of study in which students learn those skills extensively used by most craft trades before making occupational decisions. It makes broad occupational family selections and finally narrows to single occupational decisions. While learning the skills commonly used by a variety of trades, the students use this skill information to help make and refine occupational decisions. The model includes lists of clusters of skills, including core skills needed by all, skill clusters, occupational family clusters, and specialized occupational skills. The skills were identified through a questionnaire that measured the use of 588 tools, including portable hand tools, powered hand tools, test and diagnostic tools, shop machinery and equipment, wheeled vehicles, heavy mobile equipment, and associated safety processes. The questionnaire was administered to 1600 tradespersons, trades supervisors, technicians, technologists, and trades helpers to determine which skills were used in work performance. A total of 131 occupations, mostly craft trades, were involved in this survey. (KC)

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GENERIC SKILLS

Secondary School Vocational Model for Craft Trades

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Based on Data on the Use of 588 Tool Skills from 1600 Workers and Supervisors in 131 Occupations

CE031876

Published by:
Canada Employment and Immigration
Ottawa, Ontario, Canada, 1979

ACKNOWLEDGEMENT

Generic skill studies have been carried on by Arthur De W. Smith for a number of years.

GENERIC SKILLS is a project of the Advanced Development Division of the Occupational and Career Analysis and Development Branch.

Disponible en français sous le titre Habiletés Génériques: Modèle de programme d'enseignement professionnel dans les écoles secondaires pour les métiers manuels.

WHICH COMES FIRST — THE CHICKEN OR THE EGG?

Many secondary school vocational trades training programs necessitate an early occupational choice, as indicated in the following typical sequence of activities:

— Student decides to take a vocational trades program.

— **Student selects an occupation.**

— Student learns occupational skills.

— Student graduates from school and looks for a job in selected occupation.

This pamphlet suggests a rather different sequence of activities designed to defer the student's occupational decision, as follows:

— Student decides to take a vocational trades program.

— Student learns tool skills used in a variety of occupations.

— **Student selects an occupational family.**

— Student learns tool skills used in a family of occupations.

— **Student selects an occupation.**

— Student learns specialized occupational skills.

— Student graduates from school and looks for a job in selected occupation or in other trades in the same occupational family.

In the first sequence students have to select an occupation before learning the occupational skills. The decision probably has to be made about the time they enter high school. The students will learn after entering their chosen program: whether they like or dislike performing the occupational skills; whether or not they have aptitudes for these skills; and that they have narrowed their future job placements to single occupations.

In the recommended sequence the students learn those skills extensively used by most craft trades before making occupational decisions. Next they make broad occupational family selections and finally narrow single occupational decisions. While learning the skills commonly used by a variety of trades the students can use this skill information to help make and refine occupational decisions.

This pamphlet provides:

a. A hierarchy of skills, from those most often used in the craft trades to the less frequently used skills, and an indication of the extent to which these skills are used by workers in 24 different occupational groups.

b. A secondary school vocational model for craft trades along with lists of the identified skills.

GENERIC SKILLS

Generic skills are those job behaviours which are actively used in work performance, which are transferable from one job or occupation to another and which are needed for promotion to supervisory status. By this definition most communication, simple arithmetic and reasoning skills are highly generic, while advanced algebra and science skills are not.

Simply stated, the generic approach is an attempt to examine the communality of skills rather than the uniqueness of occupations. It is an attempt to determine how much Electricians, Carpenters and Secretaries are alike in skill usage. It is also an attempt to discover which skills, commonly taught, are rarely used in job performance.

Sequential studies have been carried out to measure the academic requirements for Arithmetic, Algebra, Communication, Interpersonal, Reasoning and Science skills in a wide range of non-professional occupations. The results of these studies have been synthesized and reported in the publication, **Generic Skills: Keys to Job Performance.**

GENERIC TOOL SKILLS

DATA SOURCE

A questionnaire which measured the use of 588 trade tools, including portable hand tools, powered hand tools, test and diagnostic tools, shop machinery and equipment, wheeled vehicles, heavy mobile equipment, and associated safety processes, was administered to 1600 tradesmen/women, trades supervisors, technicians, technologists and trades helpers to determine which skills are used in work performance. A total of 131 occupations, mostly craft trades, were involved in this survey.

DATA RELIABILITY

16 of these occupations were surveyed twice. In the main survey, job holders identified the skills which they used in work performance. An independent survey of 16 of the 131 occupations, in which trades supervisors provided the data on skills used in these occupations, was carried out to determine the reliability of these data. The independent survey (N equalled 160) and the sub-sample of the main survey (N equalled 159) were compared with a resulting correlation (Pearson's r) of 0.97.

DATA ANALYSES

The data were tabulated by occupation and by skill to determine which skills "belonged" to which occupations and which skills were required in all or most of the occupations. As in previous generic skills studies, a cut-off of 30% was used as the criterion (if 30% or more of the job holders responded to a particular skill, it was recorded as an occupational requirement).

Each pair of occupations was compared to determine the percentages of skills held in common (COMMUNALITY FACTOR) and the percentage of skills which each occupation used of the total skills held by the other occupation (TRANSFERABILITY FACTOR). As an example, Aircraft Mechanics use 93% of the tool skills of a Body Repairer and Body Repairers use 72% of the tool skills of an Aircraft Mechanic. These percentages are called Transferability Factors. The Communality Factor between these two occupations is, however, only 68%.

The Transferability Factors were further analyzed to determine Active Transferability (the potential of workers in an occupation to transfer to another occupation) and Passive Transferability (the potential for occupational shortages to be filled by workers from other occupations) and the results displayed on a chart of 100 occupations published under the title, **Generic Skills: Potential Transferability in the Craft Trades.** This pamphlet is primarily intended for those with career counselling and job placement functions.

The Communality Factors were further analyzed to identify trade families, composed of occupations with a high degree of similarity in skill usage. The resulting trade families, with accompanying lists of skill requirements, were published under the title, **Generic Skills: Trade Families.** This publication is seen to be particularly useful to those who believe that trades training programs should enable graduates to compete for job placement in a range of occupations rather than for a single occupation.

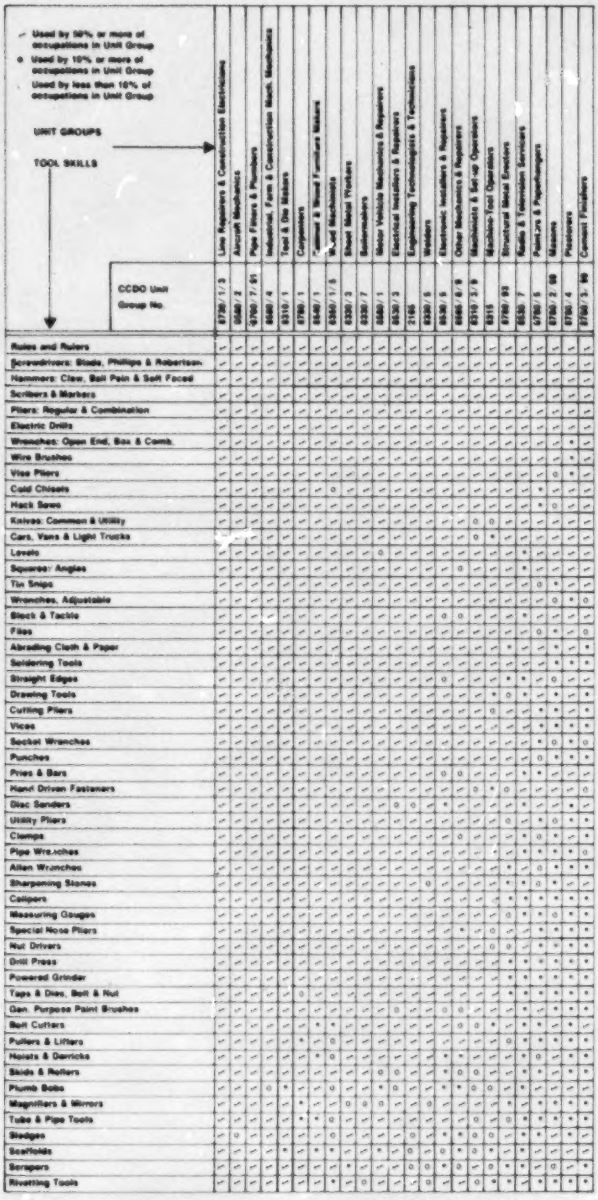
Secondary schools generally do not have the resources to offer trades training programs for the wide range of occupations reported in **Generic Skills: Trade Families.** The data from the tool skill survey have therefore been analyzed from the perspective of secondary school programs.

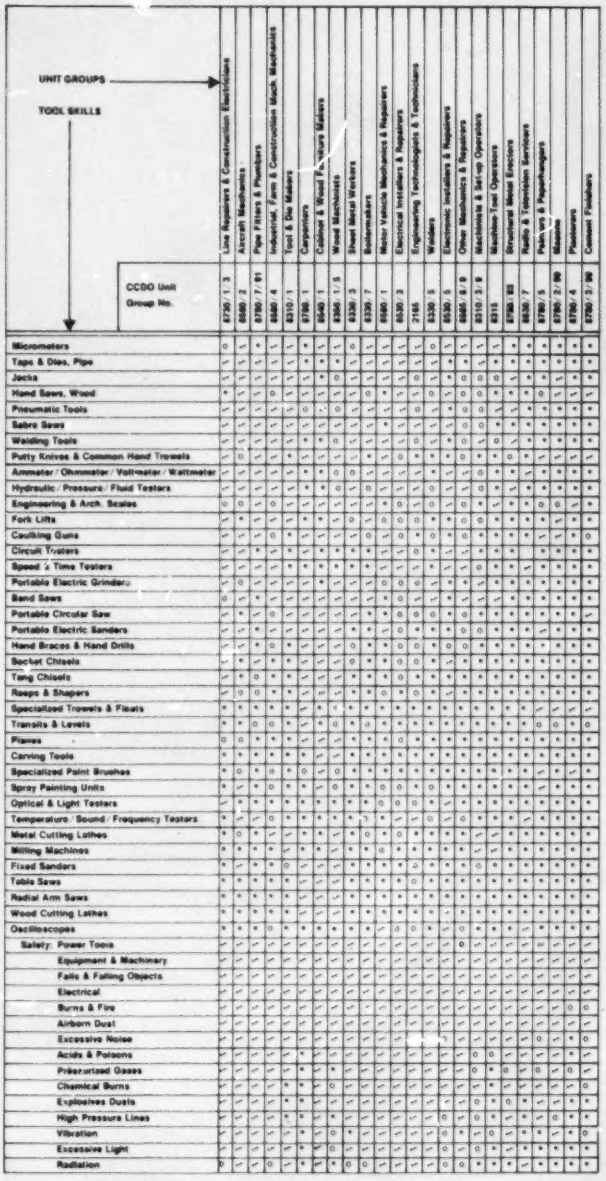
As a preliminary step matrices were developed to show the degree to which selected tool skills are used by different occupational groups (4 digit or Unit Groups from the Canadian Classification and Dictionary of Occupations, 1971). A visual inspection of these matrices (shown on the next page) makes it apparent that a large number of these skills are universal requirements, at least in the craft trades, and it would be more efficacious to teach their operational use in a generalist trades program rather than in unique occupational preparation courses.

SKILLS/UNIT GROUP MATRICES

The following matrices show the degree to which tool skills are used by different occupational unit groups. The tool skills are arranged from the most frequently used skills to the least used skills. The occupational unit groups are arranged from those on the left which use the most tool skills to those on the right which use the least.

The check marks (✓) indicate those skills which are used by 50% or more of the occupations within the occupational group. The optional symbol (o) indicates those skills which are used by 10 to 49% of the trades within the unit group and the symbol (.) indicates those skills which are not used or are used by less than 10% of the trades. The occupations within a unit group include trades, foremen/women of the trades and trades helpers. In Unit Group 2165 the occupations are Engineering Technologists and Engineering Technicians.





MODEL FOR CRAFT TRADES

The model, shown on page 6, was constructed as follows:

a. 29 trades which appear to be representative of the options generally available in vocational high schools were selected. These are shown in the outer ring of the model. As an example, out of the 24 trades for which data were available in the Unit Group "Machinists and Set-up Operators", the General Machinist was selected for inclusion in the model.

b. The tool skill data for these 29 trades were analyzed to determine those skills which are commonly required by the trades. A total of 116 skills were found to be near universal requirements and were identified as the Core Cluster of Tool Skills, shown in the inner ring of the model.

c. The remaining tool skills were further analyzed to determine whether there were any skill clusters which are required by a majority of the trades. Three clusters, Soldering Tool Skills, Welding Tool Skills, and Diagnostic and Testing Tool Skills, were found and are shown in the second ring from the centre of the model. It will be noted that the soldering skills are required by all but 6 of the trades, the welding skills are required by all but 12 of the trades and the testing and diagnostic skills by all but 13 of the trades.

d. Further analyses were then carried out to determine whether there were any remaining common skill requirements. As a result 10 families of skills were discovered. These have been identified as Occupational Family Clusters and are shown in the third ring from the centre of the model. The number of skills within each cluster are shown in brackets.

e. The number of remaining skills which could not be clustered are identified in brackets in the outer ring under the name of the trades.

It is important to note that the data collected from the tool skills survey did not include trade knowledge. Although each tool necessitates a 'body of knowledge', which can be applied in any trade, there is also an obvious requirement for specialized knowledge within each trade. Construction Electricians, for example, require specific knowledge about the National Building Codes. This specialized knowledge would have to be added to the skills in the outer ring of the model.

It is also important to realize that specialized skills would have to be added to the outer ring. The prospective Welder, for example, who had completed the Welding Cluster, would require more specialized and sophisticated skills in welding than other trades, such as the Motor Vehicle Mechanics.

The names of these tool skills, identified by clusters, are shown on the pages following the model. Implied in these lists of tools and equipment is the ability to select the appropriate tools, maintain and repair them (user maintenance), use or operate them, and the associated safety practices.

RATIONALE FOR MODEL

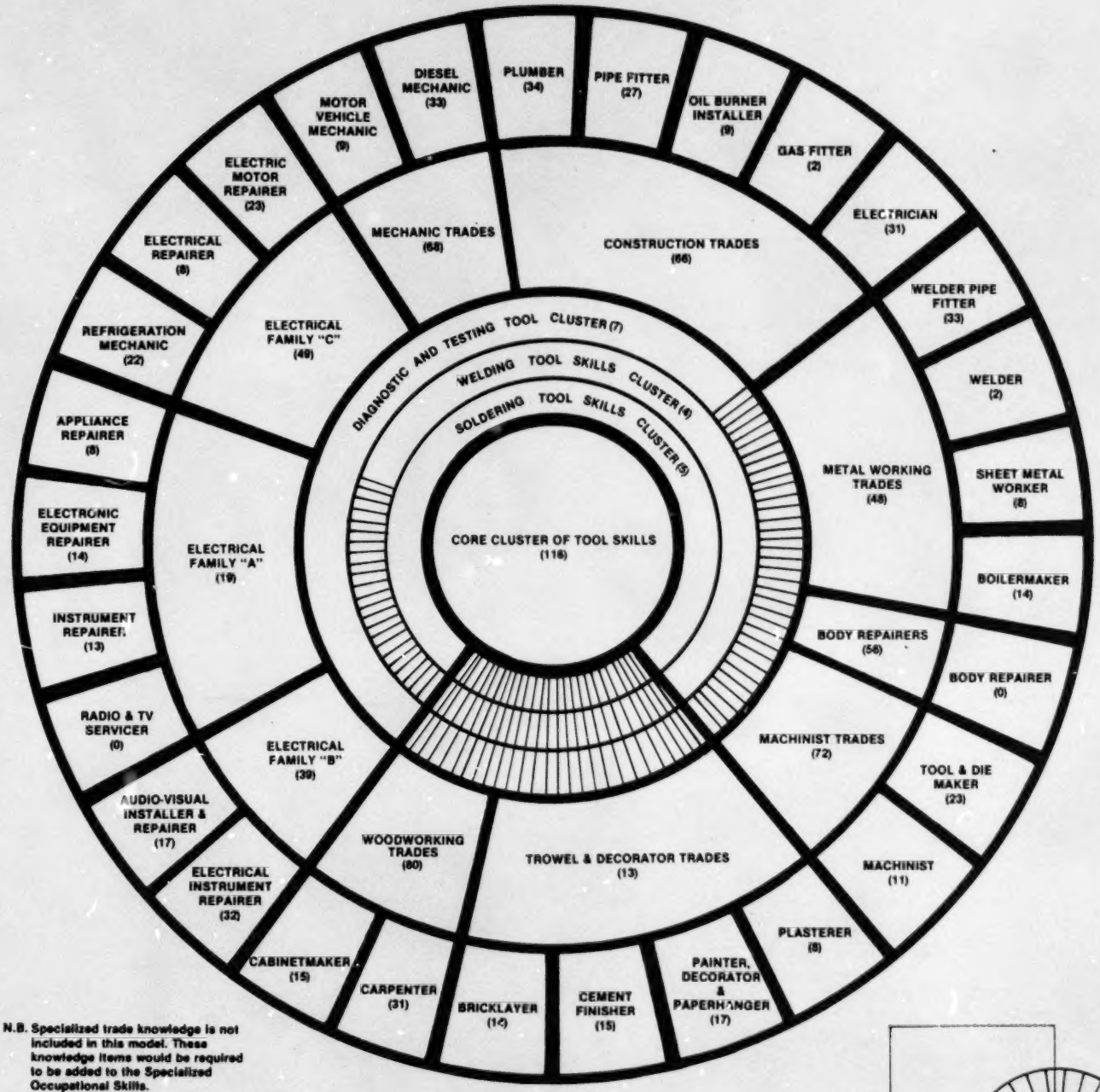
Historically, the content of academic education offered in the school systems has been based upon the assumption of universality of needs. All students therefore study Mathematics, English, Social Studies and other subjects regardless of their post-secondary aspirations or goals. Although many alternatives such as Basic Mathematics, Advanced Mathematics and Enriched Mathematics have been introduced into secondary schools, the thrust is, nevertheless, on universal requirements.

However, with the advent of vocational training into the secondary schools, the thrust for technical training was based upon the assumption of uniqueness of needs. Schools began to offer programs such as Automotive Mechanics and Welding for students who did not have aspirations to go to college or university. Intuitively many educational administrators realized that this degree of specialized training (with the obvious necessity for an early occupational decision) was not a sound educational practice. They have tried to get around the dilemma by encouraging their students to take a number of basic courses before selecting a trade for specialized training, or by melding similar occupational training courses together at the basic level (such as combining electricity and automotive mechanics). It appears obvious that there is a need for a combination of universality and uniqueness, and the model on the right suggests such a combination.

This model does not suggest how the various clusters should or could be handled in terms of school years or semesters. No data are available on learning times for the various tool skills. The number of skill items within a cluster cannot be used for this purpose because all tool skills were given the same weight in the analyses, e.g., the operation of a Phillips screwdriver and a radial arm saw were both identified as one skill.

Many of the skills included in the Core Cluster and in the Skill Clusters could be considered as being universal requirements regardless of the students' occupational aspirations. An increasing number of people are doing their own repair and maintenance tasks, as well as construction work in their own homes, and some could argue that the abilities to use soldering tools are as much a need as are the abilities to write creative essays.

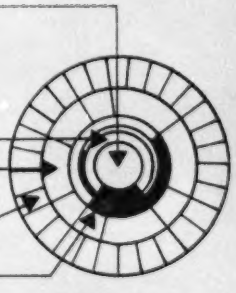
SECONDARY SCHOOL VOCATIONAL MODEL FOR CRAFT TRADES



N.B. Specialized trade knowledge is not included in this model. These knowledge items would be required to be added to the Specialized Occupational Skills.

LEGEND

Core Tool Skills Cluster:
Skill Clusters:
Occupational Family Clusters:
Specialized Occupational Skills:
Number of Skills in Cluster: (87)
Skill Clusters which are not required:



GENERIC SKILLS
Advanced Development Division
Occupational and Career Analysis and Development Branch

Employment & Immigration Canada Emploi et Immigration Canada

CLUSTERS OF SKILLS

The following skill clusters list only the tool or equipment. Implied in these lists is the ability to select the appropriate tools, maintain and repair them (user maintenance), use or operate them, and the associated safety practices.

CORE CLUSTER OF TOOL SKILLS

RULES, Tape
RULES, Steel
TAPES
STRAIGHT EDGES
CALIPERS, Outside
CALIPERS, Inside
CALIPERS, Transfer
CALIPERS, Vernier
LEVELS, Carpenter
LEVELS, Short
PLUMB BOBS
MICROMETERS, Outside
SQUARES, Try
SQUARES, Carpenter
BEVELS, Combination
COMPASSES/DIVIDERS
SCRIBERS
CHALK LINES
SOAPSTONE
PENS, Lettering

MAGNIFIERS
MIRRORS
GAUGES, Wire/Metal
GAUGES, Thickness
GAUGES, Drill/Angle
PLIERS, Regular
PLIERS, Combination
PLIERS, Vise Grip
PLIERS, Side Cutting
PLIERS, End Cutting
PLIERS, Diag. Cutting
PLIERS, Flat Nose
PLIERS, Long Nose
PLIERS, Short Nose
PLIERS, Utility
VICES, Machinist
VICES, Mach. Portable
VICES, Drill Press
CLAMPS, C & G
SCISSORS

SHEARS, 'Metal Master'
BOLT CUTTERS
WRENCHES, Open End
WRENCHES, Box
WRENCHES, Combination
WRENCHES, Socket
WRENCHES, Adjustable
NUT DRIVERS
WRENCHES, Fixed Socket
WRENCHES, Pipe
SPANNERS, Hook/Pin
WRENCHES, Allen/Bristol
SCREWDRIVERS, Blade
SCREWDRIVERS, Robertson
SCREWDRIVERS, Phillips
SCREWDRIVERS, Offset
SCREWDRIVERS, Ratchet
SCREWDRIVERS, Reed & Prince
SCREWDRIVERS, Hex Socket
THREADING SETS, Nut/Bolt

RESTORERS
EXTRACTORS
DRILLS, Twist
PULLERS/LIFTERS
Hammers, Claw
HAMMERS, Ball Point
HAMMERS, Soft Faced
SLEDGES, Short
SLEDGES, Long
COLD CHISELS, Flat
PUNCHES, Center
PUNCHES, Pin
PUNCHES, Gasket
DRIFT PINS
BARS, Wrecking
BARS, Crow
ROPE
CHAIN/HOOKS
SLINGS/LINES
BLOCK & TACKLE

JACKS
SCAFFOLDING, Prefab.
SAWS, Hack
FILES, Square
FILES, Triangular
FILES, Round
FILES, Half Round
FILES, Hill/Flat
FILES, 3 Sided
PAPER, Sand
PAPER, Emery
KNIVES, Utility
KNIVES, Pocket
KNIVES, Putty
BROOMS
WHISKS
BRUSHES, Steel Wire
BRUSHES, Paint (Gen.)
DRILLS, Elec. Portable
SAWS, Sabre

DISC SANDERS
DRILL PRESSES
BENCH GRINDERS
AUTO/VAN/TRUCK
SAFETY, Power Tools
SAFETY, Equip./Machinery
SAFETY, Falls/Falling Objects
SAFETY, Electrical
SAFETY, Burns/Fire
SAFETY, Acids/Poisons
SAFETY, Caustic Burns
SAFETY, High Pressure Lines
SAFETY, Pressure Gases
SAFETY, Airborn Dust
SAFETY, Explosive Dust
SAFETY, Excessive Noise

SKILL CLUSTERS

SOLDERING CLUSTER

SOLDERING PENCIL
IRON & TORCH
PROPANE TORCH
OXY-PROPANE TORCH
SILVER SOLDERING TOOLS

WELDING CLUSTER

OXY-ACETYLENE WELDERS
ELECTRIC WELDERS
METAL-INERT GAS WELDERS
TUNGSTEN-INERT GAS WELDERS

DIAGNOSTIC & TESTING CLUSTER

AMMETERS
OHMMETERS
VOLTMETERS
WATTMETERS
OSCILLOSCOPES
TRANSISTOR TESTERS
CIRCUIT TESTERS

OCCUPATIONAL FAMILY CLUSTERS

BODY REPAIRERS

PENCILS, Carpenter
PLIERS, Iron Worker
STRIPPERS
CLAMPS, Welding
WRENCHES, Offset
WRENCHES, Heavy Ratchet
SCREWDRIVERS, Miniature
SCREWDRIVERS, Ratchet/Spiral
SCREWDRIVERS, Torx
SCREWDRIVERS, Torque Set
SCREWDRIVERS, Bristo
SCREWDRIVERS, Slab
SCREWDRIVERS, Clutch Head
SCREWDRIVERS, Clutch Type
SCREWDRIVERS, Ignition
SCREW STARTERS
CHASERS, Thread
BITS, Rotary File
REAMERS
BENDERS, Tube
BENDERS, Pipe
CUTTERS, Internal Tube
HAMMERS, Rivetting
HAMMERS, Magnetic
HAMMERS, Scaling
HAMMERS, Body & Fender
SLEDGES, Stone
SLEDGES, Mash
CHISELS, Cape
CHISELS, Half Round
CHISELS, Diamond
CHISELS, Round Nose
CHISELS, General Purpose
CHISELS, Masonry
PUNCHES, Rivet
ANVILS
BARS, Mechanic
RASPS, Wood
RASPS, Shaper
FILES, Needle
FILES, Auger Bit
FILES, Riffler

HOLDERS, Abrasive Paper
SCRAPERS, Paint
FORMING EQUIPMENT
SPRAY PAINT UNITS
RIVETTING TOOLS
CAULKING GUNS
SANDERS, Portable
GRINDERS, Portable
IMPACT WRENCHES, Port.
IMPACT DRILLS
AIR WRENCHES
CHIPPING HAMMERS
IMPACT WRENCHES
SAFETY, Biological

CONSTRUCTION TRADES

SCALES, Engin./Arch.
LEVELS, Long
PENCILS, Carpenter
PENS, Drafting
PLIERS, Iron Worker
PLIERS, Heavy Duty
CRIMPERS
STRIPPERS
VICES, Yoke
VICES, Yoke Pipe
VICES, Chain Pipe
WRENCHES, Offset
WRENCHES, Heavy Ratchet
WRENCHES, Torque
SCREWDRIVERS, Clutch Type
SCREWDRIVERS, Ratchet/Spiral
CHASERS, Thread
BRACES, Hand
BITS, Auger
BITS, Extension
BITS, Rotary Files
DRILLS, Masonry
COUNTERSINKS
BITS, Expansion
BITS, Spade
BITS, Special Auger
DRILL BITS, Special
REAMERS, Drill
BENDERS, Tube
BENDERS, Pipe
SWAGING TOOLS

CHISELS, Cape
CHISELS, Half Round
CHISELS, Diamond
CHISELS, Round Nose
CHISELS, Gen. Purpose
CHISELS, Masonry
STAR DRILLS
NAIL PULLERS
BARS, Mechanic
AERIAL TRANSPORT
SCAFFOLDS, Self. Const.
SHOVELS, Round
SPADES, Square
PICKS
SAWS, Rod
SAWS, Carpent. Crosscut
SAWS, Rip
SAWS, Keyhole/Nest
TROWELS, Common
BRUSHES, Lubricant
BRUSHES, Paste
RIVETTING TOOLS
CAULKING GUNS
STOP WATCHES
TESTERS, Pressure
TESTERS, Compression
TESTERS, Oil/Fluid Press.
TESTERS, Smoke/Gas
TESTERS, Furnace Effic.
TESTERS, Flue-Gas Temp.
TESTERS, Temperature
CIRCULAR SAWS, Portable
SAWS, Reciprocating
HEAVY TRUCKS
SAFETY, Radiation

ELECTRICAL FAMILY "A"

PLIERS, Iron Worker
HEMOSTATS
CRIMPERS
STRIPPERS
SCREWDRIVERS, Miniature
SCREWDRIVERS, Posidrive
SCREWDRIVERS, Torx
SCREWDRIVERS, Torque Set
SCREWDRIVERS, Slab
RIVETTING, TOOLS

WHEATSTONE BRIDGES
TESTERS, Elec. Effic.
TESTERS, Elec. Circuit
STROBOSCOPES
STOP WATCHES
TESTERS, Temperature
TESTERS, Frequency
SAFETY, Radiation
SAFETY, Excessive Light

ELECTRICAL FAMILY "B"

SCALES, Engin./Arch.
TRIANGLES
T-SQUARES
PROTRACTORS
BOARD/TABLE DRAWING
PENS, Drawing
LETTERING SETS
GAUGES, Screw/Thread
HEMOSTATS
CRIMPERS
TWISTERS
STRIPPERS
WRENCHES, Torque
SPANNERS, Miniature
SCREWDRIVERS, Miniature
SCREWDRIVERS, Ratchet/Spiral
SCREWDRIVERS, Posidrive
SCREWDRIVERS, Bristo
SCREWDRIVERS, Clutch Type
SCREW STARTERS
DRILLS, Masonry
DRILLS, Countersink
DRILLS, Circle Cutters
REAMERS
PUNCHES, Prick
PUNCHES, Starting
FILES, Needle
HEAT GUNS
RIVETTING TOOLS
TESTERS, Elec. Effic.
TESTERS, Elec. Circuit
DEGAUSSING TOOLS
STROBOSCOPES
STOP WATCHES
TESTERS, Frequency

SAFETY, Vibration
SAFETY, Radiation
SAFETY, Excess. Light
SCREWDRIVERS, Slab

ELECTRICAL FAMILY "C"

GAUGES, Screw/Thread
GAUGES, Tap & Drill
PLIERS, Iron Worker
PLIERS, Heavy Duty
CRIMPERS
STRIPPERS
VICES, Yoke
VICES, Yoke Pipe
VICES, Chain Pipe
WRENCHES, Offset
WRENCHES, Torque
SCREWDRIVERS, Miniature
SCREWDRIVERS, Ratchet-Spiral
SCREWDRIVERS, Torx
SCREWDRIVERS, Slab
SCREWDRIVERS, Clutch Head
SCREWDRIVERS, Ignition
SCREW STARTERS
CHASERS, Thread
BRACES, Hand
BITS, Auger
DRILLS, Masonry
DRILLS, Countersink
BITS, Extension
DRILLS, Cutter Circle
REAMERS
BENDERS, Pipe
CHISELS, Cape
CHISELS, Half Round
CHISELS, Diamond
CHISELS, Round Nose
CHISELS, Gen. Purpose
STAR DRILLS
SCREWDRIVER, Bristo
NAIL PULLERS
SAWS, Carp.Crosscut
SAWS, Rip
SAWS, Keyhole/Nest
FILES, Needle
STONES, Rectangular

SCRAPERS, Paint
RIVETTING TOOLS
TESTERS Elec. Circuit
TACHOMETERS
CIRCULAR SAWS, Port.
SANDERS, Portable
GRINDERS, Portable
IMPACT WRENCHES, Port.
BAND SAWS

MACHINIST TRADES

RULES, Hook
RULES, w/Holder
SCALES, Engin./Arch.
CALIPERS, Herm.
MICROMETERS, Inside
MICROMETERS, Depth
MICROMETERS, Electronic
MICROMETERS, Combi-Digi
LEVELS, Machinist
CENTRE HEADS
BEVEL PROTRACTORS
BEVEL PROTRACTORS, Univ.
TRIANGLES
PROTRACTORS
GAUGES, Screw/Thread
GAUGES, Small Hole
GAUGES, Telescoping
GAUGES, Mortise
GAUGES, Trammel Head
GAUGES, Depth
GAUGES, Surface
GAUGES, Height
GAUGES, Go/No Go
GAUGES, Taper
GAUGES, Snap
GAUGES, Mach. Centre
GAUGES, Tap & Drill
GAUGES, Gear Tooth
GAUGES, Planer/Shaper
GAUGES, Universal
TONGS, Long
VICES, Portable Yoke
VICES, Metal Utility
VICES, Milling Machine
STEP BLOCKS
"V" BLOCKS
CLAMPS, Spring

CLAMPS, Hand Screw
CLAMPS, Pipe or Bar
CLAMPS, Heavy Duty
CLAMPS, Quick Action
CLAMPS, Welding
CLAMPS, Toolmakers
WRENCHES, Heavy Ratchet
WRENCHES, Torque
CHASERS, Thread
BITS, Reamers
BITS, Countersink
BITS, Extension
BITS, Circle Cutter
BITS, Drill Special
REAMERS
BENDERS, Tube
HAMMERS, Rivetting
CHISELS, Cape
CHISELS, Round Nose
PUNCHES, Rivet
FILES, Needle
STONES, Rectangular
STONES, Square
STONES, Triangular
GRINDERS, Portable
ELEC. TOOLS, Miniature
BAND SAWS
LATHES, Metal Cutting
MILLING MACHINES
SANDERS, Fixed
METAL FORMING EQUIPMENT
GRINDERS, Miniature
FORK LIFTS
FRENCH CURVES
PRECISION DRAFTING INSTRS.

MECHANIC TRADES

MICROMETERS, Inside
MICROMETERS, Depth
GAUGES, Screw/Thread
GAUGES, Surface
GAUGES, Depth
GAUGES, Height
GAUGES, Go/No Go
GAUGES, Tap & Drill
PLIERS, Iron Worker
TONGS, Long
PLIERS, Heavy Duty
CRIMPERS
STRIPPERS
VICES, Metal Utility
"V" BLOCKS
CLAMPS, Spring
CLAMPS, Welding
WRENCHES, Offset
WRENCHES, Basin
WRENCHES, Spud
WRENCHES, Heavy Ratchet
WRENCHES, Hydraulic
WRENCHES, Internal
SPANNERS, Large
SPANNERS, Miniature
SCREWDRIVERS, Miniature
SCREWDRIVERS, Ratchet/Spiral
SCREWDRIVERS, Torx
SCREWDRIVERS, Torque Set
SCREWDRIVERS, Bristo
SCREDRIVERS, Clutch Head
SCREWDRIVERS, Slab
SCREWDRIVERS, Clutch Type
SCREWDRIVERS, Ignition
SCREW STARTERS
CHASERS, Thread
BITS, Reamers
REAMERS
BENDERS, Tube
BENDERS, Pipe
CUTTERS, Internal Tube
SWAGING TOOLS
CHISELS, Cape
CHISELS, Half Round
CHISELS, Diamond
CHISELS, Round Nose
CHISELS, Gen. Purpose
PUNCHES, Rivet
PUNCHES, Drift
BARS, Mechanic
SCRAPERS, Paint
BRUSHES, Lubricant
RIVETTING TOOLS
TACHOMETERS
IGNITION TIMERS
TESTERS, Pressure
TESTERS, Compression
TESTERS, Oil/Fluid Press.
TESTERS, Smoke/Gas
SANDERS, Portable
IMPACT WRENCHES
IMPACT DRILLS
AIR WRENCHES
IMPACT WRENCHES, Port.
HEAVY TRUCKS
DUAL-AXLE TRUCKS
FORK LIFTS
WHEELED TRACTORS

METAL WORKING TRADES

RULES, Folding
SCALES, Engin./Arch.
LEVELS, Long
LEVELS, Machinist
LEVELS, Line
BEVELS, Sliding T
CENTRE HEADS
BEVEL PROTRACTORS
TRIANGLES
PROTRACTORS
GAUGES, Trammel Head
TONGS, Long
VICES, Yoke
VICES, Utility
VICES, Yoke Pipe
VICES, Chain Pipe
CLAMPS, Spring
CLAMPS, Pipe/Bar
CLAMPS, Welding
WRENCHES, Heavy Ratchet
DRILLS, Masonry
DRILLS, Countersinks
DRILLS BITS, Special
REAMERS
BENDERS, Tube
BENDERS, Pipe
BENDERS, Rivetting
HAMMERS, Scaling
CHISELS, Cape
CHISELS, Half Round
CHISELS, Diamond
CHISELS, Round Nose
CHISELS, Gen. Purpose
BARS, Mechanic
AERIAL TRANSPORT
SCAFFOLDING, Suspended
SCAFFOLDS, Self. Const.
SAWS, Keyhole/Nest
FORMING EQUIPMENT
RIVETTING TOOLS
CAULKING GUNS
CIRCULAR SAWS, Port.
GRINDERS, Portable
IMPACT WRENCHES, Port.
CHIPPING HAMMERS
IMPACT WRENCHES
BAND SAWS
FORK LIFTS

TROWEL & DECORATOR TRADES

LEVELS, Long
PENCILS, Carpenter
CHISELS, Masonry
SCAFFOLDS, Suspended
SCAFFOLDS, Self-Const.
SHOVELS, Round
SPADES, Square
WHEELBARROWS, Heavy Duty
TROWELS, Common
TROWELS, Cement
JOINTERS/GROOVERS
BRUSHES/Smoothing
STAPLERS

WOODWORKING TRADES

SCALES, Engin./Arch.
LEVELS, Long
SQUARES, Pitch/Angle
BEVELS, Sliding T
CENTRE HEADS
BEVEL PROTRACTORS
TRIANGLES
FRENCH CURVES
PROTRACTORS
PENCILS, Carpenter
GAUGES, Mortise
GAUGES, Trammel Head
GAUGES, Layout
GAUGES, Planer/Shaper
VICES, Wood Portable
VICES, Wood Regular
CLAMPS, 3 Way
CLAMPS, Hand Screw
CLAMPS, Pipe or Bar
CLAMP HEADS
CLAMPS, Quick Action
CLAMPS, Mitre
SCREWDRIVERS, Clutch Type
SCREWDRIVERS, Ratchet/Spiral
BRACES, Hand
DRILLS, Hand/Breast
DRILLS, Spiral/Push
BITS, Auger
BITS, Extension
BITS, Reamers
DRILLS, Masonry
DRILLS, Countersink
BITS, Circle Cutters
BITS, Spade
BITS, Special Auger
DRILL BITS, Special
HAMMERS, Rivetting
SOCKET CHISELS, Firmer
SOCKET CHISELS, Paring
SOCKET CHISELS, Mortising
SOCKET CHISELS, Butt
SOCKET CHISELS, Miniature
NAIL SETS
TANG CHISELS, Firmer & Butt
TANG CHISELS, Paring
TANG CHISELS, Mortising
TANG CHISELS, Miniature
NAIL PULLERS
SAWS, Carp. Crosscut
SAWS, Rip
SAWS, Keyhole/Nest
RASPS, Wood
RASPS, Shaper
STONES, Rectangular
STONES, Square
HOLDERS, Abrasive Paper
SCRAPERS, Gen. Purpose
SCRAPERS, Paint
PLANES, Smoothing
PLANES, Jack
PLANES, Jointer
PLANES, Spokeshave
PLANES, Block
STAPLERS
RIVETTING TOOLS
CAULKING GUNS
SAWS, Circular Port.
SANDERS, Portable
BELT SANDERS, Portable
PLANERS, Portable
ROUTERS, Portable
TABLE SAWS
RADIAL-ARM SAWS
BAND SAWS
LATHES, Wood Cutting
SANDERS, Fixed
JOINTERS, Fixed
SHAPERS, Fixed
ROUTERS, Fixed

SPECIALIZED OCCUPATIONAL SKILLS

APPLIANCE REPAIRERS

WRENCHES, Torque
SCREWDRIVERS, Bristo
SCREWDRIVERS, Ratchet/Spiral
SWAGING TOOLS
CHISELS, Diamond
AERIAL TRANSPORT
TESTERS, Pressure
CHISELS, Round Nose

AUDIO VISUAL REPAIRERS

RULES, Folding
FRENCH CURVES
DRAFTING INSTS., Precision
TEMPLATES
TONGS, Long
PLIERS, Heavy Duty
VICES, Port. Vacuum
BITS, Spade
SOCKET CHISELS, Firmer
PUNCHES, Aligning
SAWS, Carp. Crosscut
SAWS, Rip
RASPS, Wood
STONES, Rectangular
STAPLERS
LIGHT METERS
TESTERS, Sound Intensity

BODY REPAIRERS

Nil

BOILERMAKERS

RULES, Hook
UNIVERSAL BEVEL PROT.
PLIERS, Iron Worker
PLIERS, Heavy Duty
WRENCHES, Torque
SCREWDRIVERS, Torx
SLEDGES, Mash
DRIFT PUNCHES
DERRICKS
SCRAPERS, Paint
FURNACES/TORCHES
BRUSHES, Lubricant
LATHES, Metal Cutting
TRUCKS, Heavy

BRICKLAYERS

HAMMERS, Rivetting
CHISELS, Cape
CHISELS, Half Round
CHISELS, Diamond
CHISELS, Round Nose
CHISELS, Gen. Purpose
PICKS
SAWS, Rip
TROWELS, Drywall
FLOATS, Plasterer
POINTING TOOLS
SAWS, Masonry
TRUCKS, Heavy
FORK LIFTS

CABINETMAKERS

RULES, Folding
RULES, Hook
GAUGES, Depth
CLAMPS, Spring
HAMMERS, Magnetic
STONES, Round
STONES, Triangular
STONES, Round Edge
SHAVEHOOKS
CARVING TOOLS
TRIM PAINT BRUSHES
SPRAY PAINT UNITS
ROLLER PAINT BRUSHES
MINIATURE PAINT BRUSHES
NAIL GUNS

CARPENTERS

RULES, w/Holder
UNIVERSAL BEVEL PROT.
T-SQUARES
GAUGES, Surface
PLIERS, Iron Worker
SCREWDRIVERS, Torx
SCREWDRIVERS, Torq Set
SCREWDRIVERS, Bristo
SCREWDRIVERS, Slab
SCREWDRIVERS, Ignition
SCREWDRIVERS, Clutch Head
SCREW STARTERS
BITS, ROTARY FILES
BITS, Extension
CHISELS, General Purpose
CHISELS, Masonry
SOCKET CHISELS, Heavy Duty
STAR DRILLS
AXES, Single Blade
HATCHETS
SCAFFOLDS, Suspended
SCAFFOLDS, Self. Const.
SHOVELS, Round
PICKS
WHEELBARROWS, Light Duty
WHEELBARROWS, Heavy Duty
DRAW KNIVES
BRUSHES, Paste
GRINDERS, Portable
SAWS, Reciprocating
CHAIN SAWS

CEMENT FINISHERS

LEVELS, Line
CLAMPS, Pipe or Bar
CHISELS, Cape
CHISELS, Diamond
HATCHETS
NAIL PULLERS
PICKS
WHEELBARROWS, Light Duty
SAWS, Carp. Crosscut
SAWS, Rip
POINTERS
FLOATS, Steel/Wood
CIRCULAR SAWS, Portable
TRUCKS, Heavy
SAFETY, Vibration

DIESEL MECHANICS

CALIPERS, Herm.
MICROMETERS, Combi-Digi
LEVELS, Machinist
BEVEL PROTRACTORS
PENS, Drafting
LETTERING SETS
GAUGES, Small Hole
GAUGES, Telescoping
GAUGES, Trammel Head
HEMOSTATS
PLIERS, Punch
VICES, Yoke Portable
CLAMPS, Pipe or Bar
BRACES, Hand
CONDUIT TOOLS
HAMMERS, Rivetting
HAMMERS, Magnetic
SLEDGES, Stone
SLEDGES, Mash
DERRICKS
STONES, Rectangular
SOLDERING TOOLS, Miniature
BRUSHES, Paste
TESTERS, Temperature
CIRCULAR SAWS, Portable
GRINDERS, Portable
CHIPPING HAMMERS
RIVETTING GUNS
SAWS, Table
SAWS, Band
LATHES, Metal Cutting
TRACTORS, Heavy Duty

ELECTRIC MOTOR REPAIRERS

MICROMETERS, Inside
MICROMETERS, Depth
GAUGES, Telescoping
TONGS, Long
TWISTERS
PLIERS, Punch
CLAMPS, 3 Way
CLAMPS, Pipe or Bar
WRENCHES, Heavy Ratchet
SCREWDRIVERS, Torq Set
SCREWDRIVERS, Ignition
BITS, Reamers
BITS, Rotary Files
TANG CHISELS, Paring
DERRICKS
AERIAL TRANSPORT
FILES, Riffler
STONES, Square
HOLDERS, Abrading Paper
SPRAY PAINT UNITS
IMPACT WRENCHES
LATHES, Metal Cutting
GRINDERS, Miniature

ELECTRICAL REPAIRERS

LEVELS, Line
TRIANGLES
PENCILS, Carpenter
DRILL BITS, Specialized
SCAFFOLDS, Self. Const.
TABLE SAWS
FORK LIFTS
SAFETY, Radiation

ELECTRICIANS

RULES, Folding
TWISTERS
SCREWDRIVERS, Miniature
DRILLS, Hand/Breast
DRILLS, Spiral/Push
DRILL BITS, Reamers
BITS, Circle Cutters
CONDUIT TOOLS
HAMMERS, Rivetting
HAMMERS, Magnetic
SLEDGES, Stone
SOCKET CHISELS, Firmer
SOCKET CHISELS, Paring
SOCKET CHISELS, Butt
PUNCHES, Rivet
NAIL SETS
ANVILS
TANG CHISELS, Firmer
TANG CHISELS, Paring
DERRICKS
SHOVELS, Large
AUGERS
SAWS, Fret/Coping
RASPS, Wood
FURNACES/TORCHES
NAIL GUNS
STAPLERS
LIGHT METERS
SANDERS, Portable
BAND SAWS

ELECTRONIC REPAIRERS

TONGS, Long
HEMOSTATS
PINCERS
SCREWDRIVERS, Ignition
DRILLS, Hand/Breast
HAMMERS, Blacksmith
PUNCHES, Aligning
TANG CHISELS, Paring
NAIL PULLERS
SOLDERING TOOLS, Min.
HEAT GUNS
STAPLERS
DEGAUSSING TOOLS
TESTERS, Sound Intensity

ELEC. INSTRUMENT REPAIRERS

MICROMETERS, Depth
SHEARS, Specialized
WRENCHES, Pipe Offset
WRENCHES, Spud
WRENCHES, Heavy Ratchet
WRENCHES, Internal
SCREWDRIVERS, Torx
SCREWDRIVERS, Clutch Head
SCREWDRIVERS, Ignition
TAPS/DIES, Pipe
DRILLS, Hand/Breast
HOLE SAWS
BITS, Rotary Files
BITS, Extension
BITS, Specialized Drill
CUTTERS, Tube
FLARING TOOLS
BENDERS, Tube
SWAGING TOOLS
HOLDERS, Abrading
SOLDERING TOOLS, Miniature
BRUSHES, Lubricant
WHEATSTONE BRIDGES
TACHOMETERS
TESTERS, Pressure
TESTERS, Compression
TESTERS, Oil/Fluid Pressure
TESTERS, Velocity
TESTERS, Temperature
SCINTILLOMETERS
LATHES, Metal Cutting
SAFETY, Biological

GAS FITTERS

STAPLERS
TESTERS, Elec. Circuit
SHOVELS, Large

INSTRUMENT REPAIRERS

SCALES, Engin./Arch.
FRENCH CURVES
GAUGES, Screw/Thread
TWISTERS
SCREW STARTERS
DRILLS, Masonry
DRILL BITS, Specialized
CUTTERS, Tube
CUTTERS, Pipe
FLARING TOOLS
BENDERS, Tube
STAPLERS
TESTERS, Smoke/Gas

MACHINISTS GENERAL

LEVELS, Prec. Calibrated
GAUGES, Layout
CLAMPS, 3 Way
CLAMP HEADS
CHISELS, General Purpose
ANVILS
STONES, Carborundum
SANDERS, Portable
IMPACT WRENCHES, Port.
IMPACT WRENCHES
SAFETY, Biological

MOTOR VEHICLE MECHANICS

DRILL BITS, Specialized
NAIL PULLERS
FILES, Needle
STONES, Carborundum
STAPLERS
TESTERS, Elec. Effic.
TESTERS, Elec. Circuit
STROBOSCOPES
TESTERS, Freon Gas

PAINTERS/ DECORATORS/ PAPERHANGERS

HOLDERS, Abrading Paper
SCRAPERS, General Purpose
SHAVEHOOKS
SCRAPERS, Paint
BRUSHES, Adhesive
BRUSHES, Paint
PAINT BRUSHES, Quality
BRUSHES, Sash
BRUSHES, Trim
BRUSHES, Cutting
SPRAY PAINT UNITS
ROLLER BRUSHES
PAINT BRUSHES, Oversized
PAINT BRUSHES, Miniature
SANDERS, Portable
BELT SANDERS, Portable
SAFETY, Excessive Light

PIPE FITTERS

RULES, w/Holder
LEVELS, Machinist
LEVELS, Line
DUMPY LEVELS
SQUARES, Pitch/Angle
PROTRACTORS
BOARDS/TABLES, Drafting
LETTERING SETS
VICES, Utility
CLAMPS, Spring
CLAMPS, Pipe/Bar
CLAMPS, Welding
WRENCHES, Basin
WRENCHES, Spud
CUTTERS, Internal Tube
DERRICKS
SCAFFOLDS, Suspended
WHEELBARROWS, Heavy Duty
SOLDERING TOOLS, Min.
BRUSHES, Adhesive
GRINDERS, Portable
IMPACT WRENCHES
IMPACT DRILLS
AIR WRENCHES
CHIPPING HAMMERS, Air
GRINDERS, Miniature
SAFETY, Biological

OIL BURNER INSTALLERS

TONGS, Long
PLIERS, Punch
SCREWDRIVERS, Miniature
SCREWDRIVERS, Ignition
CONDUIT TOOLS
HAMMERS, Rivetting
PUNCHES, Rivet
SOLDERING TOOLS, Min.
STAPLERS

PLASTERERS

HATCHETS
SAWS, Carp. Crosscut
SCRAPERS, Paint
POINTERS
TROWELS, Drywall
FLOATS, Steel/Wood
POINTING TOOLS
FLOATS, Plasterer

PLUMBERS

RULES, Folding
LEVELS, Machinist
LEVELS, Line
DUMPY LEVELS
LETTERING SETS
VICES, Utility
CLAMPS, Spring
CLAMPS, Welding
WRENCHES, Basin
WRENCHES, Spud
WRENCHES, Hydraulic
WRENCHES, Internal
SPANNERS, Large
SPANNERS, Miniature
SCREWDRIVERS, Torx
SCREWDRIVERS, Torq Set
SCREWDRIVERS, Bristo
SCREWDRIVERS, Slab
BITS, Reamers
BITS, Circle Cutters
CUTTERS, Internal Tube
SLEDGES, Stone
SLEDGES, Mash
SOCKET CHISELS, Firmer
TANG CHISELS, Paring
SCAFFOLDS, Suspended
WHEELBARROW, Light Duty
SHAVEHOOKS
SCRAPERS, Paint
BRUSHES, Adhesive
BRUSHES, FLux/Cement
GRINDERS, Portable
FORK LIFTS
SAFETY, Biological

RADIO & TV SERVICERS

Nil

REFRIGERATION MECHANICS

BITS, Expansion
BENDERS, Tube
INTERNAL TUBE BENDERS
SWAGING TOOLS
CONDUIT TOOLS
HAMMERS, Rivetting
CHISELS, Diamond
PUNCHES, Rivet
NAIL SETS
DRIFT PUNCHES
SOLDERING TOOLS, Min.
NAIL GUNS
STAPLERS
CAULKING GUNS
TESTERS, Pressure
TESTERS, Compression
TESTERS, Oil/Fluid Press.
TESTERS, Smoke/Gas
TESTERS, Freon Gas
TESTERS, Flue/Gas Temp.
TESTERS, Temperature
SAFETY, Biological

SHEET METAL WORKERS

GAUGES, Mortise
GAUGES, Tap & Drill
CHISELS, Masonry
FILES, Needle
TROWELS, Common
STAPLERS
SAWS, Recriprocating
MACHINES, Metal From./ Cut.

TOOL AND DIE MAKERS

BEVELS, Sliding T
T-SQUARES
BOARDS/TABLES, Drafting
PENS, Drafting
PLIERS, Iron Worker
PLIERS, Heavy Duty
SPANDERS, Miniature
SCREWDRIVERS, Miniature
SCREWDRIVERS, Ratchet/Spiral
BITS, Rotary Files
DRILLS, Masonry
BITS, Spade
CHISELS, Half Round
CHISELS, Diamond
DRIFT PUNCHES
BARS, Mechanic
FILES, Auger Bit
FILES, Riffler
STONES, Round
STONES, Round Edge
FURNACES/TORCHES
FORMING EQUIPMENT
RIVETTING TOOLS

WELDERS

SQUARES, Pitch./Angle
ANVILS

WELDING PIPE FITTERS

RULES, w/Holder
T-SQUARES
DRAFTING INSTS. Precision
BOARDS/TABLE, Drafting
PENCILS, Carpenter
PENS, Drafting
LETTERING SETS
WRENCHES, Pipe Offset
WRENCHES, Basin
WRENCHES, Spud
WRENCHES, Hydraulic
SPANNERS, Large
SCREWDRIVERS, Ratchet/Spiral
CHASERS, Thread
BRACES, Hand
BITS, Auger
BITS, Expansion
AUGER BITS, Specialized
CUTTERS, Internal Tube
SWAGING TOOLS
SLEDGES, Stone
STAR DRILLS
SHOVELS, Round
SPADES, Square
SHOVELS, Large
PICKS
WHEELBARROWS, Light
SAWS, Carp. Crosscut
SAWS, Rip
RASPS, Wood
TESTERS, Pressure
TESTERS, Compression
TESTERS, Oil/Fluid Press.